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(54) Title: DISINFECTANT COMPOSITION

(57) Abstract: The composition comprising, as an active ingredient, at least one of the following compounds: quaternary ammonium compound, iodine, iodoform, hydantoin, isothiazolinones, hydrogen peroxide, 2-thiocyanomethylthiobenzothiazole, methylene bisthiocyanate and bifunctional aldehyde, in an aqueous solution is useful for a non-corrosive disinfectant, which can improve the quality of the internal air or sanitize a surface by eliminating microorganisms existing in said environment.

DISINFECTANT COMPOSITION

This invention relates to a novel non-corrosive disinfectant composition, to its use as a non-corrosive disinfectant for disinfecting an environment or sanitizing a surface and to a process for disinfecting an environment or sanitizing a surface.

More particularly, the invention relates to a non-corrosive disinfectant composition with a wide use and application to improve the quality of an internal air conditioning system of commercial buildings, industries, shopping malls, hospitals and any air conditioned or ventilated environment by eliminating microorganisms existing in said environment and to sanitize a surface or environment of airplanes, buses, railroad passenger wagons, public areas such as rail and bus stations, bus and train terminals, airports, ports, shopping malls, hotels, schools, clubs, hospitals, offices and banks.

The non-corrosive disinfectant composition of this invention is further characterized by a wide bactericidal spectrum, including but not limited to Vibrio cholerae INCQS 156 (ATCC-9458)
– type OGAWA, Vibrio cholerae INCQS 157 (ATCC-9459) – type INABA, Salmonella choleraesuis, Staphylococcus aureus, Bacillus, Pseudomonas, Aspergillus, Penicillium, Trichoderma and Rodothorula, low toxicity and no metal corrosion, and no degrading nor fading a woven material.

The non-corrosive disinfectant composition of this invention comprises, as an active ingredient, at least one of the following compounds; quarterly ammonium compound, iodine, iodoform, hydantoin, isothiazolinones, hydrogen peroxide, 2-thiocyanomethyl-thiobenzothiazole, methylene bisthiocyanate and bifunctional aldehyde, in an aqueous solution.

Preferably, the non-corrosive disinfectant composition comprises a mixture of quaternary ammonium compound and bifunctional aldehyde like oxalaldehyde or

glutaraldehyde in an aqueous solution.

More preferably, the non-corrosive disinfect composition comprises a mixture of quaternary ammonium compound, a polyglycolether of a fatty amine and oxalaldehyde or glutaraldehyde in an aqueous solution.

The most preferable form of the non-corrosive disinfectant composition of this invention comprises a mixture of benzalkonium chloride, a coconut fatty amine ammonium chloride and oxalaldehyde in an aqueous solution. This form of composition is biodegradable and odorless.

The non-corrosive disinfectant composition may, if desired, additionally comprise perfuming compounds, preservation compounds, surfactants, colorants and other additives.

The non-corrosive disinfectant composition may be prepared with any amount of said active ingredient(s) therein. It is also possible to prepare first a concentrated solution which can be diluted for the actual use. Preferably, the active ingredient(s) of said composition may be present in an amount of from 0.1 weight percent to 20 weight percent on the total weight of the non-corrosive disinfectant composition. If the application consists in saturating the composition in a closed environment when using the air conditioning system and applying it on a surface along its air path, the content of active ingredient(s) of said composition is preferably from 0.2 weight percent to 10 weight percent on the total weight of the non-corrosive disinfectant composition.

The disinfectant composition having an active ingredient(s) in an amount of over 20 percent can be diluted, if desired, at the time of using it for any applications.

The non-corrosive disinfectant composition can be used for disinfecting the air in closed buildings, including but not limited to commercial buildings, industries, shopping malls, hospitals by eliminating microorganisms existing in said environment, and for sanitizing a surface or environment of airplanes, buses,

railroad passenger wagons, public areas such as rail and bus stations, bus and train terminals, airports, ports, shopping malls, hotels, schools, clubs, hospitals, offices and banks, especially for an environment or a surface where an important bactericide action is necessary.

The present composition can be used for disinfecting or sanitizing an environment or a surface by spraying, vaporizing or nebulizing it as a mist in an air flow that circulates in an air conditioning system or a ventilated system, or by nebulizing or applying it directly into an environment or on a surface. By saturating the composition in a closed environment when using the air conditioning system and applying it on a surface along its air path, both environment and surfaces can be disinfected.

The amount to be sprayed, vaporized, nebulized or applied can be optionally varied depending on its application, an area or extent therefor. It is preferable to vaporize, in each 15 minutes, from 1.0 ml to 1.5 ml of the composition containing 1 % of active ingredients therein per 300 square meters' floor of a normal building for disinfecting the air in an air conditioning system. Further, it is preferable to apply directly on a surface to be sanitized or to spray into an environment a preferred amount of the diluted composition consisting of 10 parts of the composition containing 10 % of active ingredients in 100 parts of water.

In the following example all parts and percentages are by weight, and such example will not limit the present invention to such extent.

EXAMPLE

The non-corrosive disinfectant composition of the present invention was prepared by mixing 7.5% of a benzalkonium chloride (Dodigen 226, Clariant), 0.5% of a polyglycolether of a fatty amine (Dodigen 95, Clariant), 0.5% of an oxalaldehyde (Glyoxal T 40, Clariant) and 91.5% of water. (All percentages are against the total weight of said composition.) To 10 parts of said composition, 100 parts of water were added.

The prepared composition is applied to contamination of the following microorganisms in the following environment by saturating it in a closed environment using the air conditioning system. (Plate with culture medium Triptic Soy Agar and plate with culture medium Sabouraud Dextrose Agar, exposed for 15 minutes, then each incubated at 37°C/48 hours for counting bacteria and incubated at 25°C/120 hours for counting fungus)

<Microorganisms on the surface of pipe line in the air-conditioning system in the environment>

Salmonella choleraesuis and Staphylococcus aureus

<Microorganisms in the air in the environment>

Bacillus, Pseudomonas, Aspergillus, Penicillium, Trichoderma and Rodothorula

The above measurement was performed by Swab test and plate count for pipe line and plate count for the air. The result of this measurement was as follows;

Time/day	0	1	3	7	11	14
pipe line	$8x10^2$ CFU/cm^2	< 10	< 10	< 10	< 10	< 10
air	10 CFU/cm^2	2	1	ND	ND	ND

CLAIMS

1. A non-corrosive disinfectant composition comprising, as an active ingredient, at least one of the following compounds; quaternary ammonium compound, iodine, iodoform, hydantoin, isothiazolinones, hydrogen peroxide, 2-thiocyanomethylthiobenzothiazole, methylene bisthiocyanate and bifunctional aldehyde, in an aqueous solution.

2. A non-corrosive disinfectant composition as claimed in claim 1, wherein said compound or said mixture of two or more compounds is present in an amount of from 0.1 weight % to 20 weight % on the total weight of said composition.

3. A non-corrosive disinfectant composition as claimed in claim 1, wherein said compound is a mixture of quaternary ammonium compound and bifunctional aldehyde like oxalaldehyde or glutaraldehyde.

4. A non-corrosive disinfectant composition as claimed in claim 1, wherein said compound is a mixture of quaternary ammonium compound, a polyglycolether of a fatty amine and oxalaldehyde or glutaraldehyde.

5. A non-corrosive disinfectant composition as claimed in claims 3 and 4, wherein said quaternary ammonium compound is benzalkonium chloride.

6. Use of said non-corrosive disinfectant composition as claimed in claim 1 for disinfecting the air in closed buildings by spraying, vaporizing or nebulizing it into an air-conditioning system.

7. Use of said non-corrosive disinfectant composition as claimed in claim 1 for sanitizing a surface (of goods) by nebulizing it in the environment or applying it directly on the surface

8. Process for disinfecting the air in closed buildings by spraying, vaporizing or nebulizing a non-corrosive disinfectant composition as claimed in claim 1 as a mist in an air flow that circulates in an air-conditioning system

9. Process for sanitizing a surface (of goods) by nebulizing a non-corrosive disinfectant composition as claimed in claim 1 in the environment or by applying said composition directly thereto.